

What is claimed is:

- 1 1. A crucible comprising:  
2 a base container to contain liquid silicon material;  
3 a coating layer covering at least a portion of the base container, wherein the  
4 coating layer includes boron nitride.
- 1 2. The crucible of claim 1, wherein the base container includes a material  
2 having a coefficient of thermal expansion less than silicon.
- 1 3. The crucible of claim 1, wherein the base container includes graphite.
- 1 4. The crucible of claim 1, wherein the base container is integrally formed.
- 1 5. The crucible of claim 1, wherein the base container includes multiple  
2 components.
- 1 6. The crucible of claim 1, wherein the coating layer further includes silicon  
2 nitride.
- 1 7. The crucible of claim 6, wherein the coating layer includes a first layer of  
2 boron nitride adjacent to the base container and a second layer of silicon nitride over  
3 the layer of boron nitride.
- 1 8. An ingot system, comprising:  
2 a furnace;  
3 a crucible, including:  
4 a base container to contain liquid silicon material;  
5 a coating layer covering at least a portion of the base container,  
6 wherein the coating layer includes boron nitride; and

7           a cooling system to extract heat from the crucible.

1    9.     The ingot system of claim 8, wherein the cooling system includes a  
2   directional solidification cooling system.

1    10.    The ingot system of claim 8, further including a control gas system.

1    11.    The ingot system of claim 8, wherein the base container includes graphite.

1    12.    The ingot system of claim 8, wherein the base container includes silicon  
2   dioxide.

1    13.    The ingot system of claim 8, wherein the coating layer includes a first layer  
2   of boron nitride adjacent to the base container and a second layer of silicon nitride  
3   over the layer of boron nitride.

1    14.    A method of forming a silicon ingot, comprising:  
2           coating a base container with a layer including boron nitride;  
3           melting silicon material in the base container wherein the layer provides an  
4   interface between the base container and the silicon material;  
5           cooling the molten silicon material; and  
6           removing the cooled silicon material from the base container.

1    15.    The method of claim 14, wherein coating the base container includes coating  
2   a graphite base container.

1    16.    The method of claim 14, wherein coating the base container includes coating  
2   a base container with a coating that includes boron nitride and silicon nitride.

1 17. The method of claim 14, wherein cooling molten silicon includes directional  
2 solidification of silicon.

1 18. The method of claim 14, wherein removing the cooled silicon material from  
2 the base container includes non-destructive removal of the cooled silicon material  
3 from the base container.

1 19. The method of claim 14, wherein melting silicon material in the base  
2 container includes melting in an atmosphere that includes nitrogen.

1 20. The method of claim 14, wherein melting silicon material in the base  
2 container includes melting in an argon and nitrogen atmosphere.

1 21. A method of forming a silicon wafer comprising:  
2 coating a base container with a layer including boron nitride;  
3 melting silicon material in the base container wherein the layer provides an  
4 interface between the base container and the silicon material;  
5 solidifying the molten silicon material;  
6 removing the solidified silicon material from the base container;  
7 attaching a semiconductor wafer to at least a portion of the solidified silicon  
8 material to form a composite wafer.

1 22. The method of claim 21, wherein the semiconductor wafer includes single  
2 crystal silicon.

1 23. The method of claim 21, further including coupling an insulator layer  
2 between the semiconductor wafer and the portion of the solidified silicon material.

1 24. The method of claim 21, further including forming a number of electronic  
2 devices on the semiconductor wafer.

1 25. The method of claim 24, wherein forming a number of electronic devices  
2 includes forming a number of transistors.

1 26. The method of claim 21, wherein coating the base container includes coating  
2 a graphite base container.

1 27. The method of claim 21, wherein coating the base container includes coating  
2 a base container with a coating that includes boron nitride and silicon nitride.